

January 26, 2007

Mr. Fred R. Dacimo
Site Vice President
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
295 Broadway, Suite 1
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 3 - NRC INTEGRATED
INSPECTION REPORT 05000286/2006005

Dear Mr. Dacimo:

On December 31, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating Unit 3. The enclosed integrated inspection report documents the inspection results, which were discussed on January 10, 2007, with Mr. Keith Polson and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, one finding of very low safety significance (Green) was identified. This finding was also determined to be a violation of NRC requirements. However, because of the very low safety significance, and because the finding was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Senior Resident Inspector at Indian Point Nuclear Generating Unit 3.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Eugene W. Cobey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Docket No. 50-286
License No. DPR-64

Enclosure: Inspection Report No. 05000286/2006005
w/ Attachment 1: Supplemental Information
w/ Attachment 2: Mitigating System Performance
Index Verification

cc w/encl:

G. J. Taylor, Chief Executive Officer, Entergy Operations, Inc.
M. R. Kansler, President - Entergy Nuclear Operations, Inc.
J. T. Herron, Senior Vice President and Chief Operating Officer, Entergy Nuclear OPS, Inc.
C. Schwarz, Vice President, Operations Support, Entergy Nuclear Operations, Inc.
K. Polson, General Manager, Operations, Entergy Nuclear Operations, Inc.
O. Limpas, Vice President, Engineering, Entergy Nuclear Operations, Inc.
J. McCann, Director, Licensing, Entergy Nuclear Operations, Inc.
C. D. Faison, Manager, Licensing, Entergy Nuclear Operations, Inc.
R. Patch, Director of Oversight, Entergy Nuclear Operations, Inc.
J. Comiotes, Director, Nuclear Safety Assurance, Entergy Nuclear Operations, Inc.
P. Conroy, Manager, Licensing, Entergy Nuclear Operations, Inc.
T. C. McCullough, Assistant General Counsel, Entergy Nuclear Operations, Inc.
P. R. Smith, President, New York State Energy, Research and Development Authority
Assistant General Counsel, Entergy Nuclear Operations, Inc.
P. Eddy, Electric Division, New York State Department of Public Service
C. Donaldson, Esquire, Assistant Attorney General, New York Department of Law
Mayor, Village of Buchanan
R. Albanese, Four County Coordinator
S. Lousteau, Treasury Department, Entergy Services, Inc.
Chairman, Standing Committee on Energy, NYS Assembly
Chairman, Standing Committee on Environmental Conservation, NYS Assembly
Chairman, Committee on Corporations, Authorities, and Commissions
M. Slobodien, Director, Emergency Planning
B. Brandenburg, Assistant General Counsel
Assemblywoman Sandra Galef, NYS Assembly

County Clerk, Westchester County Legislature
A. Spano, Westchester County Executive
R. Bondi, Putnam County Executive
C. Vanderhoef, Rockland County Executive
E. A. Diana, Orange County Executive
T. Judson, Central NY Citizens Awareness Network
M. Elie, Citizens Awareness Network
D. Lochbaum, Nuclear Safety Engineer, Union of Concerned Scientists
Public Citizen's Critical Mass Energy Project
M. Mariotte, Nuclear Information & Resources Service
F. Zalzman, Pace Law School, Energy Project
L. Puglisi, Supervisor, Town of Cortlandt
Congressman John Hall
Congresswoman Nita Lowey
Senator Hillary Rodham Clinton
Senator Charles Schumer
G. Shapiro, Senator Clinton's Staff
J. Riccio, Greenpeace
A. Matthiessen, Executive Director, Riverkeeper, Inc.
M. Kaplowitz, Chairman of County Environment & Health Committee
A. Reynolds, Environmental Advocates
M. Jacobs, Director, Longview School
D. Katz, Executive Director, Citizens Awareness Network
P. Leventhal, The Nuclear Control Institute
K. Coplan, Pace Environmental Litigation Clinic
D. C. Poole, SENTCO
W. T. Russell, PWR SRC Consultant
W. Little, Associate Attorney, NYSDEC

Distribution w/encl:

S. Collins, RA
M. Dapas, DRA
J. Lamb, RI OEDO
R. Laufer, NRR
J. Boska, PM, NRR
P. Milano, PM (Backup)
E. Cobey, DRP
D. Jackson, DRP
C. Hott, DRP
G. Bowman, Senior Resident Inspector (Temp) - Indian Point 3
B. Wittick, Resident Inspector - Indian Point 3
R. Martin, DRP, Resident OA
Region I Docket Room (with concurrences)
ROPreports@nrc.gov (All IRs)

SUNSI Review Complete: DEJ (Reviewer's Initials)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-286

License No.: DPR-64

Report No.: 05000286/2006005

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating Unit 3

Location: 295 Broadway, Suite 3
Buchanan, NY 10511-0308

Dates: October 1, 2006 through December 31, 2006

Inspectors: G. Bowman, Senior Resident Inspector, IP3
B. Wittick, Resident Inspector, IP3
M. Cox, Senior Resident Inspector, IP2
C. Hott, Resident Inspector, IP2
S. Barr, Senior Emergency Preparedness Specialist
G. Hunegs, Senior Resident Inspector, Fitzpatrick
D. Jackson, Senior Project Engineer
K. Mangan, Senior Reactor Inspector
J. Noggle, Senior Health Physicist
K. Young, Senior Reactor Inspector
S. Lewis, Reactor Inspector
C. Long, Project Engineer

Approved by: Eugene W. Cobey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000286/2006-005; 10/01/2006 - 12/31/2006, Indian Point Nuclear Generating Unit 3; Identification and Resolution of Problems.

The report covered a three-month period of inspection by resident and region-based inspectors. One Green finding was identified, which was also a non-cited violation. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process (SDP) does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because Entergy failed to take timely corrective actions for a condition adverse to quality associated with age-related degradation of the nuclear instrumentation system. Corrective action plans, which had been developed following repetitive equipment failures in 2003, had been deferred several times, resulting in the power range nuclear instrument 41 (N-41) over-temperature delta temperature reactor trip function being declared inoperable on March 20, 2006. Entergy entered this issue into the corrective action program and updated their corrective action plan to begin systematic replacement of the nuclear instrumentation system drawers in the upcoming refueling outage.

This finding was more than minor because it affected the Equipment Performance attribute of the Mitigating Systems cornerstone; and, it impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the over-temperature delta temperature reactor protective function, in combination with other reactor protective functions, ensures that the reactor remains in a condition which is permissible for power operation by ensuring that the departure from nucleate boiling ratio remains within acceptable values during an "uncontrolled control rod assembly withdrawal at power" transient, as defined in Chapter 14 of the Updated Final Safety Analysis Report. This finding was evaluated using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The inspectors determined that the finding was of low safety significance because it did not represent a design or qualification deficiency, loss of safety function for the train or system, and was not risk-significant due to external event initiators.

This finding had a cross-cutting aspect in the area of human performance because Entergy did not provide the resources necessary to maintain long term plant safety by minimization of long-standing equipment issues, and by minimizing preventive maintenance deferrals, to address a condition adverse to quality in the nuclear instrumentation system. (Section 4OA2)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Indian Point Nuclear Generating Unit 3 operated at or near full power throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - 2 samples)

a. Inspection Scope

For the onset of cold weather conditions, the inspectors reviewed the readiness for extreme weather conditions of risk-significant systems. The inspectors reviewed Entergy's adverse weather procedures, operating experience, corrective action program (CAP), Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), operating procedures, staffing, and applicable plant documents to determine the types of adverse weather challenges to which the site is susceptible.

Additionally, the inspectors evaluated implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of and during adverse weather conditions. The inspectors performed plant walkdowns and reviews to verify that plant features and procedures for operation and continued availability of the ultimate heat sink during adverse weather were appropriate including equipment availability for performance of the reactor shutdown function under the weather conditions assumed prior to shutdown. The documents reviewed are listed in Attachment 1. The following risk-significant systems that were required to be protected from adverse weather conditions were selected and collectively they represented two inspection samples of risk-significant systems:

- Exterior tanks (condensate storage tank, refueling water storage tank, and fire water storage tanks); and
- Emergency diesel generators (EDGs), 480 volt switchgear room, and service water supply to the EDGs.

b. Findings

No findings of significance were identified.

1R02 Evaluations of Changes, Tests, or Experiments (71111.02 - 17 Samples)a. Inspection Scope

The inspectors reviewed four safety evaluations completed during the previous two year period. The safety evaluations were completed by Entergy to evaluate if proposed changes to the facility or procedures described in the UFSAR, or changes to tests or experiments not described in the UFSAR required NRC approval prior to implementation in accordance with the requirements of 10 CFR 50.59. The safety evaluations reviewed were distributed among Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones. The inspectors reviewed the selected safety evaluations to verify that the licensee had appropriately concluded that the changes and tests could be accomplished without prior NRC approval in accordance with 10 CFR 50.59 and, if prior approval was required, it was obtained prior to implementing the change. Additionally, the inspectors verified that safety issues pertinent to the changes were properly resolved or adequately addressed. The following safety evaluations were reviewed:

- UFSAR Appendix 14A - Changes to Turbine Missile Analysis due to Power Uprate;
- Indian Point Nuclear Generating Unit 3 - Install Isolation Valve and Associated Fill Valve in 3/4"- SI -1501 Line #31;
- Develop New Fuel Design - Westinghouse 15x15 Upgraded Fuel Design; and
- Indian Point Nuclear Generating Unit 3 Cycle 14 Core Reload Design.

The inspectors also reviewed 13 screened "out of scope" evaluations for changes, tests and experiments for which the licensee determined that safety evaluations were not required. This review was performed to verify that the licensee's threshold for performing safety evaluations was consistent with 10 CFR 50.59. In addition, the inspectors reviewed the administrative procedures that were used to control the screening, preparation, and issuance of the safety evaluations to ensure that the procedure adequately covered the requirements of 10 CFR 50.59. The listing of screened "out of scope" evaluations and documents reviewed is provided in Attachment 1.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04Q - 2 samples)a. Inspection ScopePartial Walkdown

The inspectors performed two partial system walkdowns to verify the operability of redundant or diverse trains and components during periods of system train unavailability or following periods of maintenance. The inspectors referenced the system procedures, the UFSAR, and system drawings in order to verify that the alignment of the available

Enclosure

train was proper to support its required safety functions. The inspectors also reviewed applicable condition reports and work orders to ensure that Entergy had identified and properly addressed equipment discrepancies that could potentially impair the capability of the available train. The documents reviewed are listed in Attachment 1. The inspectors performed a partial walkdown of the following systems which represented two samples:

- 31 EDG system following maintenance activities; and
- 31 central control room air conditioning unit during 32 central control room air conditioning unit repairs.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q - 9 samples)

a. Inspection Scope

The inspectors conducted tours of the nine areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with Entergy's administrative procedures; fire detection and suppression equipment was available for use; passive fire barriers were maintained; and compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Entergy's fire plan. The inspectors used procedure ENN-DC-161, "Transient Combustible Program," in performing the inspection. The inspectors evaluated the fire protection program against the requirements of License Condition 2.H. The documents reviewed are listed in Attachment 1. This inspection satisfied nine inspection samples for fire protection tours. The areas inspected included:

- Fire zones 4A, 6A, and 9;
- Fire zones 35A and 36A;
- Fire zone 367;
- Fire zones 20A, 20A, 21A, and 63A;
- Fire zones 5, 6, 7, 17A, 18A, and 19A;
- Fire zone 381;
- Fire zones 7A and 74A;
- Fire zones 60A and 73A; and
- Fire zones 2 and 2A.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors reviewed selected risk-significant plant design features and Entergy's procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analysis and design documents, including the Individual Plant Examination (IPE) and the UFSAR, engineering calculations, and abnormal operating procedures. In addition, the inspectors reviewed areas and equipment that may be affected by internal flooding in the 55 foot elevation of the primary auxiliary building from the non-essential service water system. The documents reviewed are listed in Attachment 1. This inspection represented one sample.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A - 1 sample)

a. Inspection Scope

The inspectors performed an inspection of the 31 and 32 component cooling water heat exchangers. The inspectors verified that Entergy used the periodic maintenance method outlined in Electric Power Research Institute document NP-7552, "Heat Exchanger Performance Monitoring Guidelines." The inspector reviewed the results of the last inspections and eddy current tests for each of the heat exchangers. The documents reviewed during the inspection are listed in Attachment 1. The inspection of the 31 and 32 component cooling water heat exchangers represented one inspection sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Inspection (71111.11Q - 1 sample)

a. Inspection Scope

On November 27, 2006, the inspectors observed licensed operator simulator training to assess operator performance during several scenarios to verify that operator performance was adequate and evaluators were identifying and documenting crew performance problems. The inspectors evaluated the performance of risk significant operator actions, including the use of emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, the implementation of appropriate actions in response to alarms, the performance of timely control board operation and manipulation, and the oversight and direction provided by the shift manager. The inspectors also reviewed simulator fidelity with respect to the actual

plant. Licensed operator training was evaluated against the requirements of 10 CFR 55, "Operators' Licenses." The documents reviewed are listed in Attachment 1. This observation of operator simulator training constituted one inspection program sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 1 sample)

a. Inspection Scope

The inspectors reviewed performance-based problems involving selected structures, systems, or components (SSCs) to assess the effectiveness of the maintenance program. Reviews focused on:

- Proper Maintenance Rule scoping;
- Characterization of reliability issues;
- Changing system and component unavailability;
- 10 CFR 50.65 (a)(1) and (a)(2) classifications;
- Identifying and addressing common cause failures;
- Trending of system flow and temperature values;
- Appropriateness of performance criteria for SSCs classified (a)(2); and
- Adequacy of goals and corrective actions for SSCs classified (a)(1).

The inspectors reviewed system health reports, maintenance backlogs, and Maintenance Rule basis documents. The inspectors evaluated the maintenance program against the requirements of 10 CFR 50.65. The documents reviewed are listed in Attachment 1. The following maintenance rule sample was reviewed:

- 31 and 32 central control room air conditioning units.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work Control (71111.13 - 5 samples)

a. Inspection Scope

The inspectors reviewed the following five activities to verify that the appropriate risk assessments were performed prior to removing equipment from service for planned work. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The documents reviewed are listed in Attachment 1. The following four emergent activities and one planned activity were observed and treated as five inspection samples:

- Work order (WO) IP3-06-01395, 32 control building exhaust fan thermal overloads found tripped;
- WO IP3-06-01500, instrument air leak in turbine building;
- WO IP3-06-24056, refueling water storage tank level instrument LIC-921 "as-found" values out of tolerance;
- Condition report (CR) IP3-06-03789, 33 safety injection (SI) pump thrust bearing recirculation line leak; and
- WO IP3-06-15482, post-work test (PWT) for 31 EDG west side inlet air header replacement.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 4 samples)

a. Inspection Scope

The inspectors reviewed operability determinations to assess the acceptability of the evaluations, the use and control of compensatory measures, and compliance with TS. The inspectors' review included a verification that the operability determinations were made as specified by ENN-OP-104, "Operability Determinations." The technical adequacy of the determinations was reviewed and compared to the TS, UFSAR, and associated design basis documents. The documents reviewed are listed in Attachment 1. The following four evaluations were reviewed and each constituted inspection program samples:

- CR IP3-2006-01791, 32 central control room air conditioning unit biological growth;
- CR IP3-2006-03414, 35 service water pump vacuum breaker leakage;
- CR IP3-2006-03676, refueling water storage tank level indicator LIC-921 failure; and
- CR IP3-2006-03621, 33 SI pump casing leak.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17A - 1 sample, 71111.17B - 8 samples)

.1 Annual Inspection (71111.17A - 1 sample)

a. Inspection Scope

The inspectors reviewed modification documents and reviewed the installation and testing of modifications to the Indian Point Nuclear Generating Unit 3 control room charcoal filtration system in accordance with modification ER-04-3-016. The modifications changed the control room charcoal filters to 2" filters from 1" filters to meet the requirements of NRC Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal." The modification was completed under work order IP3-04-13612. The post-modification testing, per work order IP3-04-19783, included completion of 3-PT-R032C, "Control Room Filtration System Functional Test."

b. Findings

No findings of significance were identified.

.2 Biennial Inspection (71111.17B - 8 samples)

a. Inspection Scope

The inspectors reviewed eight risk-significant plant modification packages selected from the design changes performed on systems associated with the Initiating Events, Mitigating Systems and Barrier Integrity cornerstones within the past two years. The inspectors reviewed the selected modifications to verify that the design bases, licensing bases, and performance capability of the risk-significant SSCs had not been degraded as a result of the modifications. Additionally, the inspectors assessed whether the modifications had adversely affected the availability, reliability, or functional capability of the system or associated interface systems. The following modifications were selected for review:

- Improvements to the safety injection actuation circuit agastat timer;
- Substitution of Fischer and Porter flowmeter with a Brooks flowmeter;
- Battery 33 replacement;
- CH-AOV-212 thermal relief modification;
- EDG air start system and EDG building ventilation system;
- SI system modification (stretch power uprate);
- Modify N2 backup supply for auxiliary feedwater system valves and turbine speed controller; and
- Control room heating, ventilation, and air conditioning system damper 'C' removal.

For the modifications selected, the inspectors verified that systems potentially affected by the modification remained consistent with the design and licensing basis. The inspectors reviewed a variety of parameters to determine if the modification had impacted either of these bases. The parameters reviewed included electrical, steam,

fuel, or air requirements; replacement component and materials compatibility and qualification; adequate heat removal capacity; automatic and manual control signal for startup, shutdown and control; external and internal hazards protection such as flooding, fire, freeze protection, high energy line break and missile protection; pressure boundary and ventilation boundary integrity; structural integrity; process medium design parameters such as voltage, current, fluid flow, and pressure; and potential failure modes. The parameters were reviewed to verify that they were technically appropriate and consistent with the UFSAR and associated design basis documents.

The inspectors reviewed the post-modification testing, functional testing, and instrument calibration records to determine readiness for operations. This review included verifying that the modification did not create unintended system interactions, SSC performance characteristics were not affected by the modification, original modification design assumptions were correct, and the modification test acceptance criteria were appropriate and had been met. Additionally, the inspectors verified that the timing sequence was correct and response time limits had not been exceeded.

The inspectors also reviewed the affected procedures, drawings, design basis documents, supporting calculations, analysis, and relevant UFSAR sections to verify that the affected documents had been appropriately updated. Additionally, the inspectors verified affected normal, abnormal, and emergency operating procedures, and testing and surveillance procedures had been updated as required. The inspectors verified that necessary TS changes had been identified and, if NRC approval was required, it was obtained prior to performing the modification.

The inspectors reviewed selected condition reports associated with the modification process and design change notices that were issued during the installation. The inspectors verified that the problems associated with the installation were adequately resolved and that conditions adverse to quality identified by the licensee's processes had been appropriately corrected. The documents reviewed are listed in Attachment 1.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 6 samples)

a. Inspection Scope

The inspectors reviewed post maintenance test procedures and associated testing activities for selected risk significant mitigating systems to assess whether the effect of maintenance on plant systems was adequately addressed by control room and engineering personnel. The inspectors verified that test acceptance criteria were clear, demonstrated operational readiness and were consistent with design basis documentation; test instrumentation had current calibrations and the range and accuracy for the application; and tests were performed, as written, with applicable prerequisites satisfied. Upon completion, the inspectors verified that equipment was returned to the proper alignment necessary to perform its safety function. Post

maintenance testing was evaluated against the requirements of 10 CFR 50, Appendix B, Criterion XI, "Test Control." The documents reviewed are listed in Attachment 1. The following post-maintenance test activities were reviewed and represented six inspection program samples:

- WO IP3-06-01411, 33 SI pump following mechanical seal replacement;
- WO IP3-06-03169, 31 central control room air conditioning units;
- WO IP3-06-10608, 33 EDG after six year preventative maintenance;
- WO IP3-05-24467, 31 EDG following preventative maintenance inspection and starting air piping modification;
- WO IP3-06-24554, 33 SI pump following thrust bearing recirculation line repairs; and
- WO IP3-05-25128, 33 motor-driven auxiliary boiler feedwater pump.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 4 samples)

a. Inspection Scope

The inspectors witnessed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether the SSCs satisfied TS, UFSAR, Technical Requirements Manual, and Entergy procedure requirements. The inspectors verified that test acceptance criteria were clear, demonstrated operational readiness and were consistent with design basis documentation; test instrumentation had current calibrations and the range and accuracy for the application; and tests were performed, as written, with applicable prerequisites satisfied. Upon surveillance test completion, the inspectors verified that equipment was returned to the status specified to perform its safety function. The inspectors evaluated the surveillance tests against the requirements in TS. The documents reviewed are listed in Attachment 1. The following surveillance tests were reviewed and represented four inspection program samples (one reactor coolant system leak detection sample, one in-service test sample, and two surveillance test samples):

- 3-PT-Q70, "Steam Generator Blowdown Radiation Monitor Functional (R-19)," Revision 21, and SOP-RCS-004, "Reactor Coolant Leakage Surveillance," Revision 22;
- 3-PT-M13A1, "Reactor Protection Logic Channel Functional Test," Revision 5;
- 3-PT-M100, "Post Accident Monitoring Functional Test," Revision 8; and
- 3-PT-Q26, "Nitrogen Valves 891A, 891B, 891C, 891D, 863, and 550," Revision 14.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 2 samples)a. Inspection Scope

The inspectors reviewed the two temporary modifications listed below. The inspectors assessed the adequacy of the 10 CFR 50.59 evaluations for these temporary modifications including verifying that the installation was consistent with the modification documentation; the drawings and procedures were updated as applicable; and the post-installation testing was adequate. The documents reviewed are listed in Attachment 1. This inspection satisfied two inspection program samples for temporary modifications.

- I3-930339903, upgrade of the heating, ventilation, and air-conditioning in RM-80 room of the primary auxiliary building; and
- TA-05-3-082, installation of temporary valve with plug to isolate steam and water leak.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05 - 1 sample)a. Inspection Scope

A region-based specialist inspector conducted an inspection of Entergy's corrective actions related to the existing Indian Point Alert and Notification system (ANS) failures, and also reviewed the progress made in the design and installation of the new siren system. The inspection was conducted onsite October 3 through 6 and November 13 through 17, 2006, per the baseline inspection program deviation authorized by the NRC Executive Director of Operations in a memorandum dated October 31, 2005.

The inspector was onsite the first week of October to assess the licensee's response to the September 19, 2006, loss of siren event which occurred as the result of the computer software database failing to reconnect following a preventive maintenance reboot of the siren system computer. This event involved a failure of the automatic startup sequence following the reboot, and although the automatic startup failed, manual rebooting of the ANS computer remained available and maintained the ANS functional. The inspector reviewed aspects of the event to determine if the failure met the criteria of a significant finding, as defined in NRC Inspection Manual Chapters

(IMCs) 0609, Appendix B, "Emergency Preparedness Significance Determination Process," and 0612, "Power Reactor Inspection Reports."

On October 6, 2006, Entergy and the NRC conducted a public meeting in Buchanan, New York, during which Entergy discussed additional corrective actions to be taken to assure the proper operation and maintenance of the existing siren system and the progress in the design and installation of the new siren system. Entergy submitted a letter to the NRC on October 18, 2006, documenting these additional corrective actions. The inspector reviewed the planned corrective actions to verify they were appropriate to address the siren failures which had occurred.

The inspector returned to the site in November to assess the licensee's compliance with and implementation of the corrective actions. The inspector observed the biweekly re-boot of the current system's control computer and reviewed the log books of the technicians responsible for the "around-the-clock" monitoring of the current system. The inspector also reviewed the circumstances of a November 9, 2006, event that involved the loss of the licensee's ability to actuate 13 of 156 sirens for approximately 30 minutes, due to a maintenance technician opening the antenna connection on a specific siren. The inspector reviewed the condition report for the event and discussed it with members of the Indian Point emergency preparedness staff, to determine if this failure met the criteria of a significant finding, as defined in NRC IMC 0609, Appendix B, and IMC 0612.

The inspector interviewed the senior project manager and the nuclear information technology manager for the new siren system to understand Entergy's progress towards meeting the milestone dates required by the NRC's Confirmatory Order dated January 31, 2006. While on site, the inspector reviewed the progress of Entergy's installation of the new siren system components, especially to understand the licensee plans for addressing the remaining challenges in pole/siren and radio communication tower installation. The inspector also reviewed Entergy's progress in obtaining Department of Homeland Security approval of the Indian Point Energy Center Prompt Alert and Notification System Design Report.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01 - 14 samples)

a. Inspection Scope

During December 20 through 29, 2006, the inspector conducted the following activities to verify that the licensee was properly implementing physical, engineering, and administrative controls for access to high radiation areas, and other radiologically

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controlled areas, and that workers were adhering to these controls when working in these areas. Implementation of the access control program was reviewed against the criteria contained in 10 CFR 20, TS, and Entergy's procedures.

- (1) There were no radiation work permits for airborne radioactivity areas with the potential for individual worker internal exposures of >50 millirem (mrem) committed effective dose equivalent (CEDE).
- (2) During 2006, there were no internal dose assessments for any actual internal exposures greater than 50 mrem CEDE.
- (3) The licensee's physical and programmatic controls for highly activated materials stored underwater in the spent fuel pools were reviewed and evaluated through walkdown observation of these areas.
- (4) A review of licensee radiation protection program self-assessments and audits during 2006 was conducted to determine if identified problems were entered into the corrective action program for resolution.
- (5) Seventeen condition reports associated with the radiation protection access control and as low as reasonably achievable (ALARA) areas, between January 2006 and December 2006, were reviewed and discussed with licensee staff to determine if the follow-up activities were being conducted in an effective and timely manner commensurate with their safety significance.
- (6) Based on the condition reports reviewed, repetitive deficiencies were screened to determine if the licensee's self-assessment activities were identifying and addressing these deficiencies.
- (7) There was one occupational exposure performance indicator incident reported during the current assessment period. This was associated with installation of the lower core barrel assembly during the Spring 2006 Unit 2 refueling outage and was determined that there were no overexposures or substantial potential for overexposures.
- (8) There were no significant dose gradients requiring relocation of dosimetry for the radiologically significant jobs observed during this inspection.
- (9) Changes to the high dose rate high radiation area and very high radiation area procedures since the last inspection in this area were reviewed and management of these changes was discussed with the Radiation Protection Manager.
- (10) Controls associated with potential very high radiation areas that included reactor core flux monitor calibration thimble withdrawal and coordination with plant operations prior to allowing personnel entry into the reactor cavity sumps was discussed with duty watch radiation protection technicians.

- (11) All accessible locked high radiation area entrances were verified to be locked through challenging the locks or doors.
- (12) Several radiological condition reports (see Section 4OA2) were reviewed to evaluate if the incidents were caused by radiation worker errors and determine if there were any trends or patterns and if the licensee's corrective actions were adequately addressing these trends.
- (13) Radiation protection technician work performance was evaluated with respect to their knowledge of the radiological conditions, the specific radiation protection work requirements and radiation protection procedures.
- (14) Several radiological condition reports (see Section 4OA2) were reviewed to evaluate if the incidents were caused by radiation protection technician errors and determine if there were any trends or patterns and if the licensee's corrective actions were adequately addressing these trends.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02 - 7 Samples)

a. Inspection Scope

During December 20 through 29, 2006, the inspector conducted the following activities to verify that the licensee was properly maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). Implementation of the ALARA program was reviewed against the criteria contained in 10 CFR 20.1101(b) and Entergy's procedures.

- (1) Site specific trends in collective exposures and source-term were reviewed, indicating an increasing trend reflecting higher than average pressurized water reactor radiation levels and an increasing trend in collective exposures for Unit 2. Unit 3 exposure and source-term reflect lower than average pressurized water reactor (PWR) collective exposures and source-term.
- (2) The collective exposure results from the Spring 2006 Unit 2 refueling outage were compared to the applicable ALARA planning dose estimates and evaluated for any dose overruns and applicable causes.
- (3) The assumptions and basis for the 2007 annual exposure estimates were reviewed based on applicable procedures. These estimates included both dose rate and man-hour estimate calculations.
- (4) Source-term data was reviewed to assess an increasing trend from 2003 through 2006. Interviews were conducted with the ALARA supervisor and the Radiation

Protection Manager relative to reactor water chemistry and source-term controls being evaluated to reduce occupational exposure.

- (5) There were three declared pregnant workers during 2006 and their exposure records and monitoring control records were reviewed.
- (6) The ALARA program self-assessments and audit were reviewed to determine if the licensee's overall audit program scope and frequency met the requirements of 10 CFR 20.1101 (c).
- (7) With respect to the condition reports reviewed (see Section 4.02), any repetitive deficiencies that were identified were reviewed with respect to Entergy's self-assessment and audit program identification and resolution.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 1 sample)

.1 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors reviewed performance indicator (PI) data for the below listed cornerstones and used Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4, to verify individual PI accuracy and completeness.

Mitigating Systems Cornerstone

- Safety System Functional Failures.

The inspectors reviewed data and plant records from March 2004 to September 2006. The records reviewed included PI data summary reports, licensee event reports, operator narrative logs, and maintenance rule records. The inspectors verified the accuracy of the number of critical hours reported, and interviewed the system engineers and operators responsible for data collection and evaluation.

b. Findings

No findings of significance were identified.

.2 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness PI program. Specifically, the inspector reviewed CRs, and radiological controlled area dosimeter exit logs for the past four calendar quarters. These records were reviewed for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in Nuclear Energy Institute 99-02, to verify that all occurrences that met the criteria were identified and reported.

b. Findings

No findings of significance were identified.

.3 Radiological Environmental Technical Specifications/ Offsite Dose Calculation Manual - Radiological Effluent Occurrences

a. Inspection Scope

The inspector reviewed a listing of relevant effluent release reports for the past four calendar quarters, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences per site that exceed 1.5 mrem/quarter whole body or 5.0 mrem/quarter organ dose for liquid effluents; and 5.0 mrad/quarter gamma air dose, 10.0 mrad/quarter beta air dose, and 7.5 mrad/quarter for organ dose for gaseous effluents. The inspector reviewed the following documents to ensure the licensee met all requirements of NEI 99-02:

- Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- Dose assessment procedures.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Routine Problem Identification and Resolution (PI&R) Program Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of all items entered into Entergy's CAP. The review was accomplished by accessing Entergy's computerized database for CRs and attending CR screening meetings.

In accordance with the baseline inspection modules, the inspectors selected CAP items across the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for additional follow-up and review. The inspectors assessed Entergy's threshold for problem identification, the adequacy of the cause analyses, extent of condition review, and operability determinations, and the timeliness of the specified corrective actions. The CRs reviewed are noted in Attachment 1.

b. Findings and Observations

No findings or observations of significance were identified.

.2 Annual Problem Identification and Resolution Sample Review: Operator Workarounds (71152 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of the aggregate impact of operator burdens and workarounds. The inspectors reviewed Entergy's implementation of procedures OAP-45, "Operator Burden Program," Revision 1 and PL-163, "Operations Expectations and Standards," Revision 2. The inspectors verified that operator workarounds and burdens were appropriately entered into the CAP and were dispositioned commensurate with their safety significance.

b. Findings and Observations

No findings or observations of significance were identified.

.3 Annual PI&R Sample Review: Power Range Nuclear Instrument Performance Issues (71152 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of problems associated with nuclear instrumentation (NI) system performance associated with N-41 quadrant power tilt ratio (QPTR) alarms, and the effectiveness of the associated corrective actions. The inspectors interviewed the engineers responsible for the system, reviewed condition reports from 2003 to

present which documented the issue, assessed Entergy's threshold for problem identification, the adequacy of the cause analyses, extent of condition review and reviewed the associated engineering evaluations and corrective actions. The inspectors also reviewed NI system performance following N-41 drawer replacement. The documents reviewed during the inspection are listed in Attachment 1.

b. Findings and Observations

Introduction. The inspectors identified a Green NCV because Entergy failed to take timely corrective actions to address a condition adverse to quality associated with age-related degradation of the nuclear instrumentation system. This was determined to be a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

Description. The nuclear instrumentation system was placed in a 10 CFR 50.65(a)(1) monitoring status on July 8, 2003, because an excessive number failures prevented the system from meeting performance goals. The cause of the repeated failures was attributed to age-related degradation and maintenance practices. Planned corrective actions to address the nuclear instrumentation failures included a preventative maintenance activity involving systematic replacement of the drawers. A maintenance plan was developed in September 2003 and drawer replacement was scheduled to start during the next Indian Point Unit 3 refueling outage in early 2005, but was subsequently deferred.

In November 2005, Indian Point Unit 3 began to experience lower detector quadrant power tilt ratio alarms due to erratic operation of power range detector N-41. Although this alarm condition repeated several times over the next few months, identification of the deficiency was hindered by the transient nature of the condition. In December 2005, the isolation amplifier for the quadrant power tilt circuitry was replaced, since that was the only section of the nuclear instrumentation drawer that appeared to be affected. After additional alarms were received and NRC inspectors questioned the impact of the erratic operation on instrument circuitry, Entergy identified that the over-temperature delta temperature reactor trip function was also being impacted. After alarming again on March 19, 2006, the over-temperature delta temperature channel associated with N-41 was declared inoperable, and the N-41 drawer was removed from service and replaced with a spare drawer. The exact cause of the alarms was not identified, but in general, was attributed to age-related degradation. Entergy identified that a contributing cause was failure to perform planned maintenance designed to address age degradation of the nuclear instruments.

The inspectors reviewed the maintenance and performance history of the nuclear instrumentation system and determined that, although the condition had first been identified in 2003, no corrective actions had been taken to address the degradation as of March 2006. Drawer replacement had been deferred first to 2007, then to 2009. Additionally, despite the repetitive problems associated with power range N-41 drawer from November 2005 to March 2006, and identification of a cause of drawer failure as failure to perform the corrective maintenance plan developed in 2003, the condition reports addressing these failures were treated as low significance and administratively closed to work orders.

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Analysis. The inspectors determined that this finding was a performance deficiency because Entergy failed to implement timely corrective actions to address a condition adverse to quality for nuclear instrumentation system failures. This finding was reasonably within Entergy's ability to foresee and prevent, because the performance degradation of the nuclear instrumentation system was identified in July 2003. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of a willful violation of NRC requirements or Entergy's procedures.

This finding was more than minor because it affected the Equipment Performance attribute of the Mitigating Systems cornerstone; and, it impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the over-temperature delta temperature reactor protective function, in combination with other reactor protective functions, ensures that the reactor remains in a condition which is permissible for power operation by ensuring that the departure from nucleate boiling ratio remains within acceptable values during an "uncontrolled control rod assembly withdrawal at power" transient as defined in Chapter 14 of the UFSAR. This finding was evaluated using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The inspectors determined that the finding was of low safety significance because it did not represent a design or qualification deficiency, loss of safety function for the train or system, and was not risk-significant due to external event initiators.

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not provide the resources necessary to maintain long term plant safety by minimization of long-standing equipment issues, and by minimizing preventive maintenance deferrals, to address a condition adverse to quality in the nuclear instrumentation system, as identified in the July 2003, 10 CFR 50.65(a)(1) action plan.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Contrary to the above, on November 7, 2006, the inspectors identified that Entergy failed to promptly correct a condition adverse to quality associated with age-related degradation of the nuclear instrumentation system. This condition was identified in July 2003, and at the time of the inspection, corrective actions were not scheduled to be implemented until 2009. Entergy entered this issue into the corrective action program (CR IP2-2007-00104) and plans to commence systematic replacement of the nuclear instrumentation system drawers in the upcoming 2007 refueling outage. Additionally, a new, more detailed component level nuclear instrumentation system calibration test has been implemented on a two year frequency to help improve the reliability of the instrumentation. Because this finding is of very low safety significance and has been entered into the CAP, this violation is being treated as an NCV, consistent with Section V1.A of the Enforcement Policy: **NCV 05000286/2006005-01, Failure to Implement Corrective Actions for Degraded Nuclear Instrumentation System Performance.**

.4 PI&R Annual Sample - Selected Issue Follow-up Inspection - Residual Heat Removal (RHR) System Gas Pressure Buildup (71152 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of pressure increases noted in the RHR pump discharge piping, and the effectiveness of the engineering evaluation and associated corrective actions. The pressure buildup in the RHR pump discharge piping was noted to have occurred following operation of 33 SI pump and/or weekly RHR piping vent evolutions. The inspectors interviewed the engineers responsible for the system, reviewed condition reports from 2005 to present which documented the issue, assessed Entergy's threshold for problem identification, the adequacy of the cause analyses, and reviewed the associated engineering evaluations and corrective actions. The documents reviewed during the inspection are included in Attachment 1.

b. Findings and Observations

No findings or observations of significance were identified. The inspectors determined that engineering personnel had adequately evaluated the issue and Entergy's corrective actions to monitor leakage and gas accumulation were being tracked and managed. Entergy's threshold for problem identification was appropriate, this issue had been entered into the corrective action program, and an adequate corrective action plan had been developed.

.5 PI&R Annual Sample - Selected Issue Follow-up Inspection - Review of Corrective Actions Associated with Five Risk Assessment NCVs issued to Indian Point Energy Center in 2006 (71152 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of the effectiveness of corrective actions associated with the five NCVs issued to Indian Point Energy Center in 2006 for inadequate risk assessments during maintenance. These included NCVs:

- 50-286/2006-002-01, "Failure to Perform a Risk Assessment for Emergent Work on the IP3 Appendix R EDG;"
- 50-286/2006-002-02, "Failure to Perform a Risk Assessment for Emergent High Wind Conditions During 33 EDG Planned Maintenance;"
- 50-286/2006-003-01, "Failure to Perform a Risk Assessment for Emergent Work Performance at IP3 of N-42 Axial Offset Calibration;"
- 50-247/2006-002-04, "Failure to Risk Assess Scaffolding Construction in the Cable Spreading Room Resulting in an IP2 Reactor Trip;" and
- 50-247/2006-003-07, "Failure to Assess Maintenance Activities at IP2 on Valve SI-869A."

The inspectors interviewed the planning and operations personnel responsible for performing risk assessments, reviewed condition reports from 2006 to present which

documented the issue, assessed Entergy's threshold for problem identification, the adequacy of the cause analyses, extent of condition review, and corrective actions. The documents reviewed during the inspection are included in Attachment 1.

b. Findings and Observations

No findings of significance were identified. Corrective actions have been implemented by operations to standardize risk assessment practices between Indian Point Units 2 and 3 watchstanders and to reinforce that operations watchstanders are responsible for risk assessing off-hours emergent work. However, the inspectors identified recent issues which demonstrate that problems associated with performing risk assessments for emergent work and schedule changes still exist. The inspectors identified that Entergy's corrective actions for previous NCVs did not consistently address all causal factors. Specifically, the corrective actions did not address the established administrative controls which would have required risk assessments to be performed or revised for schedule changes or emergent work. Entergy's corrective actions, which included training for risk assessment personnel and operators, was ineffective in that, on August 21, 2006, the Indian Point Unit 3 Appendix R EDG was removed from service for emergent work, and the risk assessment of this work was not administratively controlled in accordance with Entergy's formal risk assessment procedures. The inspectors determined that this issue was of minor significance, because while it was a deficiency in the implementation of the formal risk assessment process, a risk assessment was completed for the work. The inspectors reviewed Entergy's corrective actions for the recent issue and determined that they were adequate.

.6 Annual PI&R Sample Review: Corrective Actions for Scaffolding Control Issues (71152 - 1 sample)

a. Inspection Scope

The inspectors conducted a detailed review of Entergy's corrective actions for a number of scaffolding control issues identified earlier in 2006. The inspectors reviewed the condition reports written to address each of the issues to verify corrective actions were appropriate and implemented in a timely manner, and verified that procedural changes to strengthen control over scaffold construction had been implemented. The inspectors reviewed two recent Entergy self-assessments on the scaffolding control program to verify that the deficiencies identified were adequately dispositioned. The inspectors also completed a walkdown of scaffolds in the plant to verify that they would not have any adverse impact on safety-related equipment.

b. Findings and Observations

No findings or observations of significance were identified. The inspectors determined that corrective actions for the previously identified scaffold control issues had been implemented in a timely manner. Entergy's assessments were self-critical and the deficiencies identified were appropriately entered into the corrective action program. During plant walkdowns, the inspectors did not identify any examples where scaffolding would impact the operation of safety-related or risk-significant component.

.7 Semi-Annual Trend Review (71152 - 1 sample)

a. Inspection Scope

The inspectors performed a semi-annual review to identify trends that might indicate the existence of a more significant safety issue. The inspectors included in this review repetitive or closely related issues that may have been documented by Entergy outside of the normal CAP, such as trend reports, performance indicators, major equipment problem lists, maintenance rule assessments, and maintenance and CAP backlogs.

The inspectors reviewed Entergy's CAP database during the third and fourth quarters of 2006 to assess the total number and significance of condition reports written in various subject areas, such as equipment or processes, to discern any notable trends in these areas. The inspectors reviewed Entergy's quarterly assessment/trend reports for both CAP and Quality Assurance for the second and third quarters of 2006 to ensure they were appropriately evaluating and trending identified conditions.

b. Findings

No findings of significance were identified.

.8 Occupational Radiation Safety Cornerstone

a. Inspection Scope

The inspector reviewed 17 CRs associated with the radiation protection program that were initiated between January and December 2006. The inspector verified that problems identified by these condition reports were properly characterized in the CAP, and that applicable causes and corrective actions were identified commensurate with the safety significance of the radiological occurrences. The documents reviewed are listed in Attachment 1.

b. Findings and Observations

No significant findings or observations were identified.

4OA5 Other Activity

.1 (Closed) URI 05000286/2001012-01, Adequacy of Hemyc Cable Wrap Fire Barrier Qualification Test and Evaluation

Inspection Report 05000286/2001 documented the potential inadequacy of Hemyc fire barrier wrap material at Indian Point Unit 3. The issue was unresolved pending further NRC review to determine whether the qualification tests of the Hemyc fire wrap systems were acceptable. In subsequent NRC fire tests, results indicated that Hemyc/MT materials cannot be routinely relied upon as one hour fire barriers. The NRC staff has completed a significant effort informing industry of the concerns associated with these materials by issuing Information Notice (IN) 2005-07, "Results of Hemyc Electrical

Raceway Fire Barrier System Full Scale Fire Testing,” and GL 2006-03, “Potentially Nonconforming Hemyc and MT Fire Barrier Configurations.” As required by GL 2006-03, Indian Point Unit 3 has responded appropriately to the NRC concerns by identifying all applications of Hemyc/MT materials, implementing compensatory measures as appropriate, and initiating corrective actions to resolve as necessary. Therefore, the NRC staff has determined that there was no performance deficiency associated with the issue and this unresolved item (URI) is closed.

.2 Temporary Instruction (TI) 2515/169, Mitigating Systems Performance Index (MSPI) Verification

a. Inspection Scope

The objective of TI 2515/169 is to verify that the licensee has correctly implemented the Mitigating Systems Performance Index (MSPI) guidance for voluntarily reporting unavailability and unreliability of the monitored safety systems. On a sampling basis, the inspector validated the accuracy of the unavailability and unreliability input data used for both the 12-quarter period of baseline performance and for the first reported results (second calendar quarter 2006). Specific attributes examined by the inspectors per this TI included: surveillance activities which, when performed, do not render the train unavailable for greater than 15 minutes; surveillance activities which, when performed, do not render the train unavailable due to credit for prompt operator recovery actions; and for each MSPI system, on a sampling basis, the inspectors independently confirmed the accuracy of baseline planned unavailability, actual planned and unplanned unavailability, and the accuracy of the failure data (demand, run, and load, as appropriate) for the monitored components.

b. Findings

No findings of significance were identified.

Per TI 2515/169-05 reporting requirements, Attachment 2 to this report documents additional information pertaining to the inspectors review.

.3 Groundwater Contamination Investigation

a. Inspection Scope

Continued inspection of Entergy’s plans, procedures, and characterization activities affecting the contaminated groundwater condition at Indian Point, relative to NRC regulatory requirements, was authorized by the NRC Executive Director of Operations in a Reactor Oversight Process deviation memorandum approved October 31, 2005 (ADAMS Accession Number ML053010404). Accordingly, continuing oversight of licensee progress has been conducted throughout this inspection period consisting of onsite inspections, frequent review of licensee performance, progress and achievements, and periodic communications with Federal, State, and local government stakeholders.

An inspection was conducted during November 13 through 17, 2006, that focused on the Unit 1 spent fuel pool (SFP) leak to evaluate any prior opportunities of discovery or licensee deficiencies in mitigation of the current Unit 1 source of groundwater contamination on site. The inspection included a review of the performance of the Unit 1 SFP, a review of Unit 1 SFP radionuclide data, SFP leak rate calculations, and modifications to the Unit 1 SFP leak groundwater drainage system. The inspection also included review of the construction and floor plan drawings of the Unit 1 facility, physical inspection of areas and facilities, and sampling data as appropriate.

The inspections also verified licensee groundwater contamination assessment and monitoring commitments identified in Entergy's March 24, 2006 letter (NL-06-033). In addition, the NRC staff reviewed Entergy's groundwater sampling program. The NRC Staff, with New York State Department of Environmental Conservation officials, observed groundwater sampling and protocols relative to chain-of-custody verification. Throughout the inspection period, the NRC continued to split samples of offsite, site boundary, and other selected monitoring wells with Entergy and New York State Department of Environmental Conservation to verify and confirm the accuracy of the licensee's analytical results.

During onsite inspection activities, NRC staff met with Entergy to review the results of its pumping test using recovery well 1 (RW-1), adjacent to the Unit 2 SFP. The short-term pumping test was conducted to develop detailed information on groundwater flow characteristics relative to the application of possible containment and recovery of the contaminated groundwater in the vicinity of the Unit 2 SFP. An important part of the analysis was to determine the appropriate pumping rate in RW-1 to create a groundwater capture zone in and around the Unit 2 SFP which would not affect the groundwater migration of Strontium-90 (SR-90) contaminated groundwater in the vicinity of the Unit 1 SFP.

NRC staff reviewed Entergy's long-term groundwater protection program, which outlines the identification and application of certain indicator monitoring wells and boundary wells to support its groundwater radiological environmental monitoring program. The objectives of the monitoring activities are to:

- Detect and quantify potential release of licensed radioactive material to adjacent properties via groundwater;
- Detect and quantify release of licensed radioactive materials to the Hudson River via groundwater;
- Provide leak detection capabilities for potential sources of groundwater contamination such as the Unit 2 SFP;
- Detect and quantify any new or emergent sources of groundwater contamination, such as a spill or leak from a radioactively contaminated component or system; or change in the site hydrology that mobilizes or exposes radioactive contamination sequestered in the soil or bed rock;
- Verify the accuracy of the characterization and hydrology of existing groundwater contamination (e.g., locations, depths, radionuclides of concern, radionuclide concentrations and migration or transfer rates are as predicted); and
- Monitor and evaluate the effectiveness of remediation or intervention actions.

b. Findings and Observations

No findings of significance were identified.

The NRC samples were analyzed by the NRC's contract laboratory, the Oak Ridge Institute for Science and Education, Environmental Site Survey and Assessment Program (ORISE/ESSAP) radioanalytical laboratory. NRC's assessment of the licensee's sample analytical results data generally indicated that the licensee's analytical contractor continued to report sample results that were consistent with NRC's analytical results. However, a discrepancy was identified with regard to certain strontium-90 (Sr-90) sample analyses. Specifically, Entergy's analytical sample results for 14 samples from 7 on-site monitoring wells, which were collected from August 1, 2006 through September 18, 2006, were not consistent with NRC sample results. In this case, the NRC identified and confirmed that the licensee's contractor reported Sr-90 groundwater concentrations that ranged from approximately 10 percent to 50 percent lower than indicated by NRC's results. NRC confirmed that its analytical results were comparable to analytical results reported by the New York State Department of Environmental Conservation.

The licensee generated a condition report in accordance with its internal corrective action program and initiated an investigation of the processes and protocols applied by its contracted analytical laboratory relative to the Sr-90 discrepancy. As part of its investigation, Entergy required its contractor to conduct its own internal investigation. In the interim, Entergy contracted the services of another independent laboratory. Aspects of this matter, including quality assurance protocols, were previously discussed in NRC Inspection Report 05000247/2006-003.

Upon completion of its investigation, Entergy concluded that, based on the information provided by their contract laboratory, the cause for the data disparity was inconclusive. Accordingly, Entergy terminated its contract with the affected contractor and initiated a new contract with a different analytical laboratory. Subsequently, the NRC analyzed additional monitoring well samples to verify the reliability of the groundwater sample database; and continues to split samples with the licensee and the State of New York for selected monitoring wells.

The NRC's ORISE/ESSAP sample results are available in ADAMS under the following Accession Numbers: ML070110548, ML070110559, ML070110561, ML070110577, and ML070110602. To date, sample results from site boundary wells and offsite environmental groundwater sampling locations have not indicated any detectable plant-related radioactivity.

NRC's review of Entergy's "Pumping Test Report," which included input from New York State and U.S. Geological Survey hydrology experts, identified some differences in the interpretation of certain technical data relative to radionuclide migration. Specifically, Entergy interpreted the groundwater flow system as being fully confined and acting as a porous media. However, upon close inspection of the data, the monitoring well responses did not appear to be uniform during the pumping period, allowing the

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possibility that the groundwater flow system could also be viewed as indicating dual permeability properties, which may be indicative of a combination of porous media and a fracture flow system. In addition, the report provided data indicating that one of the Unit 1 monitoring wells, where Sr-90 had been detected (MW-53), indicated a substantial reduction in water level during the test which could be indicative of a possible connection to the Unit 1 Sr-90 contaminated groundwater plume. Accordingly, Entergy is considering additional pump testing, using lower flow rates over longer time periods, to more firmly establish the steady-state conditions necessary to ensure an adequate capture zone for the Unit 2 SFP while avoiding cross-contamination from the adjacent Sr-90 contaminated groundwater plume.

Entergy's pump test provided important and valuable information relative to the effect that application of the RW-1 recovery well may have on groundwater, and useful insights for possible groundwater contamination remediation strategies. The effort also provided insights for other areas that could be evaluated to assist in understanding of significant fracture flows. For example, integrated analysis of the groundwater flow system, using cross-sections between the Indian Point Units (North to South) and projecting East to the Hudson River may provide plots of encountered fracture zones, hydraulic gradients, flow directions in both the horizontal and vertical directions. Additionally, the discussions identified information from the geologic logs, cores, geophysical surveys and groundwater flow and quality data from each monitoring well that could be used in constructing cross-section diagrams of various fracture zones. Such effort would be useful for the identification of indicator and boundary monitoring wells, performance indicators, and frequency of required observations in support of the "Long-Term Groundwater Monitoring Protection Program." At present, there is still uncertainty in the vertical flow and transport conditions, and whether fracture zones or fracture sets control radionuclide concentration transport observed in the monitoring wells.

The new protocols for the groundwater sampling procedure were expected to enhance the integration and comprehensiveness of analyses. In particular, measurement to be made at the time of sampling such as turbidity, dissolved oxygen, pH, specific conductance, temperature, and depth to water following the sampling would provide valuable information in interpreting the monitoring well data.

4OA6 Meetings, including Exit

Exit Meeting Summary

On January 10, 2007, the inspectors presented the inspection results to Mr. Keith Polson and other Entergy staff members, who acknowledged the inspection results presented. Entergy did not identify any material as proprietary.

Public Meeting On Alert and Notification System Sirens

On October 6, 2006, the NRC held a public meeting where Entergy provided an update on the status of the installation of the new siren system being installed. They also

provided a review of corrective actions taken and planned to improve the performance of the existing siren system.

ATTACHMENT 1: SUPPLEMENTAL INFORMATION

ATTACHMENT 2: MITIGATING SYSTEM PERFORMANCE INDEX VERIFICATION

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Dacimo, Site Vice President
K. Polson, General Manager, Plant Operations
P. Rubin, General Manager, Plant Operations
J. Ventosa, Director, Engineering
J. Comiotes, Director, Nuclear Safety Assurance
A. Williams, IP3 Operations Manager
A. Vitale, Site Operations Manager
T. Barry, Security Manager
J. Donnelly, Manager, Maintenance
P. Conroy, Manager, Licensing
B. Sullivan, Emergency Planning Manager
T. Jones, Licensing Supervisor
L. Lee, Systems Engineering Supervisor
T. Orlando, Manager, Design Engineering
C. Smyers, Shift Manager, Operations
P. Parker, Superintendent, Maintenance
D. Shah, Systems Engineer
S. Wilkie, Fire Protection Engineer
J. Kayani, Senior Engineer, Eddy Current Program Lead
J. Raffaele, Design Engineering Electrical Supervisor
J. Bencivenga, Design Engineering Mechanical
M. Miller, Operations Procedures
G. Dahl, Licensing Engineer
D. Croulet, Licensing Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

06000286/2006-005-01	NCV	Failure to Implement Corrective Actions for Degraded Nuclear Instrumentation System Performance (Section 4OA2.3)
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Closed

05000286/2001-012-01	URI	Adequacy of Hemyc Cable Wrap Fire Barrier Qualification Test and Evaluation (Section 4OA5.1)
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 3-SOP-V-003, Rev 9: "Diesel Generator Building Heating and Ventilation System Operation"
 3-COL-V-001, Rev 14: "Heating and Ventilation System for the Turbine Hall, Control Building, ABFP Building, DG Building, Containment, PAB, and FSB"
 OAP-008, Rev 2: "Severe Weather Preparations"
 ARP-013, Rev 33: "Hi Room Temp Control Bldg EL 33FT"
 OAP-48, Seasonal Weather Preparation, Rev. 03

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 04-1330-MD-00-RS, Rev 0: "HHSI System Modification (SPU)"
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 3-PC-OL05B, "6.9 KV Under Frequency Relay Calibration"
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 ER-03-3-107, Rev 1: "Modify N2 Backup Supply System for AFWS Valves and Turbine Speed Controller"
 ER-04-3-003, Rev 0: "IP3 EDG Starting Air System and EDG Building Ventilation System Improvements"
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Section 1R04: Equipment Alignment

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Entergy Drawing No. 9321-H-20293, "Flow Diagram, Starting Air to Diesel Generators"

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IP3-2006-01791

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Section 1R06: Flood Protection Measures

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3-AOP-FLOOD-1, Rev. 2: "Flooding"

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IP3-2004-02739	IP3-2005-00803	IP3-2006-01791	IP3-2006-03621
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 3-PT-M79A, Rev 34: "31 EDG Functional Test"
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 3-PT-Q116C, Rev 11: "33 Safety Injection Pump Functional Test"

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IP3-2006-03378	IP3-2006-03675	IP3-2006-03678
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IP3-2006-03148

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Section 1R23: Temporary Modifications

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EN-DC-136, Rev 0: "Temporary Modifications"

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 3-PT-M14A, Rev 3: "Safety Injection System Logic Functional Train A"
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 3-PT-Q36, Rev 18: "IST Stroke Test of Valves AC-MOV-822A and B and AC-751A and B"
 3-PT-Q88, Rev 15: "Component Cooling Pumps Functional Test"

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LIST OF ACRONYMS

ADAMS	agencywide documents and management system
ALARA	as low as reasonably achievable
ANS	alert notification system
AFWS	auxiliary feed water system
CAP	corrective action program
CCR	central control room
CEDE	committed effective dose equivalent
CFR	Code of Federal Regulations
CR	condition report
EDG	emergency diesel generator
EPRI	Electric Power Research Institute
ESSAP	Education, Environmental Site Survey and Assessment Program
GL	generic letter
IMC	inspection manual chapter
IN	information notice
IP2	Indian Point Nuclear Generating Unit 2
IP3	Indian Point Nuclear Generating Unit 3
IPE	individual plant examination
LER	licensee event report
mrem	millirem
MSPI	mitigating system performance index
NI	nuclear instrument
NCV	non-cited violation
NEI	Nuclear Energy Institute

NRC	Nuclear Regulatory Commission
ODCM	offsite dose calculation manual
ORISE	Oak Ridge Institute for Science and Education
PARS	publicly available records
PI	performance indicator
PWT	post-work test
QPTR	quadrant power tilt ratio
RETS	radiological effluents technical specifications
RHR	residual heat removal
RP	radiation protection
RW - 1	Recovery Well 1
SDP	Significance Determination Process
SE	safety evaluation
SFP	spent fuel pool
SI	safety injection
SSC	systems, structures, components
T	temperature
TI	Temporary Instruction
TS	Technical Specifications
URI	unresolved item
USFAR	Updated Final Analysis Report
WO	work order

ATTACHMENT 2

MITIGATING SYSTEM PERFORMANCE INDEX VERIFICATION

Question 1: For the sample selected, did the licensee accurately document the baseline planned unavailability hours for the MSPI systems?

Answer: The inspectors identified several examples where Entergy over-counted unavailability hours, resulting in a non-conservative determination of planned unavailability. These errors were determined to be non-significant and were corrected by Entergy. They did not result in a change in index color.

Question 2: For the sample selected did the licensee accurately document the actual unavailability hours for the MSPI systems?

Answer: The inspectors identified one example where unavailability hours were incorrectly counted. This error was non-significant and did not result in a change in index color.

Question 3: For the sample selected, did the licensee accurately document the actual unreliability information for each MSPI monitored component?

Answer: The inspectors determined that, for the sample selected, Entergy accurately documented actual unreliability information for each MSPI system.

Question 4: Did the inspector identify significant errors in the reported data, which resulted in a change to the indicated index color?

Answer: The inspectors did not identify any significant errors in the reported data which resulted in a change in an index color.

Question 5: Did the inspector identify significant discrepancies in the basis document which resulted in (1) a change to the system boundary; (2) an addition of a monitored component; or (3) a change in the reported index color?

Answer: The inspectors did not identify any significant discrepancies in the basis document.